

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Numbers: 50-275/92-21 and 50-323/92-21

Docket Numbers: 50-275 and 50-323

License Numbers: DPR-80 and DPR-82

Licensee: Pacific Gas and Electric Company
Nuclear Power Generation, B14A
77 Beale Street, Room 1451
P.O. Box 770000
San Francisco, California 94177


Facility Name: Diablo Canyon Units 1 and 2

Inspection at: Diablo Canyon Site, San Luis Obispo County,
California

Inspection Conducted: June 29 through July 2, and July 20 through July 29,
1992

Inspectors: D. Acker, Reactor Inspector

Approved By:


M. Royack, Acting Chief
Engineering Section

8/12/92
Date Signed

Summary:

Inspection on June 29 through July 2, and July 20 through July 29, 1992
(Report Nos. 50-275/92-21 and 50-323/92-21)

Areas Inspected:

The areas inspected in this routine engineering inspection included the installation of the new emergency diesel generator in Unit 2 and follow-up of previously identified items. Construction Modules 51051, 51053, 51065, 70300, and 70312 and Inspection Procedures 37700 and 92701 were used as guidance for this inspection.

Results:

Conclusions and Specific Findings:

The inspector concluded that:

The new (sixth) emergency diesel generator electrical systems were being installed in accordance with engineering requirements.



The craft personnel had adequate knowledge of electrical testing criteria.

That there was adequate quality assurance overview of this project in the areas examined.

Significant Safety Matters:

None

Summary of Violations:

None

Open Items Summary:

The inspector closed two unresolved items during this inspection.



DETAILS

1. Persons Contacted

Pacific Gas and Electric Company

- *M. Angus, Manager, Technical Services
- M. DeWitt, Quality Assurance Engineer
- *B. Goelzer, System Engineer
- J. Griffin, Senior Compliance Engineer
- *M. Hicks, Startup Engineer
- D. Miklush, Acting Plant Manager
- *R. Ricks, Engineering Test Coordinator
- *D. Shelly, Senior Plant Engineer
- *D. Sisk, Compliance Engineer
- *S. Szuch, Quality Engineer

*Denotes those attending the telephone exit meeting on July 29, 1992.

The inspector also held discussions with other licensee personnel during the course of the inspection.

2. Previously Identified Items

a. (Closed) Unresolved Item 50-275, 50-323/91-07-01: 4 Kilovolt Switchgear Fault Current Rating

The Electrical Distribution System Functional Inspection identified that calculated fault current exceeded 4 kilovolt (kV) switchgear ratings during certain plant operations. Calculated fault current exceeded switchgear ratings when one or more emergency diesel generators (EDGs) were operated in parallel with the main generator.

The licensee took action to minimize the tests which required parallel operation of the main generator and one or more EDGs, and performed a calculation which showed that a maximum (bolted) fault was a low probability event during the limited time the main generator was operated in parallel with an EDG.

The inspector reviewed the licensee's actions and calculation and concluded that:

- o The actions to minimize the risk from a bolted fault were adequate.
- o The licensee's calculation adequately demonstrated that a bolted fault during parallel operation of the main generator and an EDG was a low probability event.

Based on the licensee's evaluation and independent NRC evaluations the inspector concluded that the core damage frequency for the



bolted fault condition was low and had little safety significance.

This item is closed.

b. (Closed) Unresolved Item 50-323/92-06-01: Adequacy of Conduit Supports

During a previous inspection, the inspector had noted a new conduit installation which, although not yet in use, did not appear to be installed in accordance with the Updated Final Safety Analysis Report (UFSAR).

Sections 3.10.2.12 and 8.3.1.4.7 of the UFSAR required that no unsupported span (of conduit) shall exceed 8 feet 6 inches. The inspector had identified that new EDG conduit in the turbine building visually appeared to have support spacing which exceeded 8 feet 6 inches. The licensee determined that the installation in question was installed in accordance with sheet 4 of Field Change E-15127, Revision 0, dated March 6, 1991. This Field Change allowed a maximum distance between supports of 10 feet.

The licensee determined that the actual installation did exceed the UFSAR 8 feet 6 inch criteria, but was within the 10 feet criteria of Field Change E-15127. The licensee concluded that the support for the conduit in question was technically adequate and that the UFSAR would be revised to incorporate the new criteria.

The inspector reviewed Field Change E-15127 and the licensee's evaluation that the conduit supports were technically adequate. The inspector concluded that the licensee's evaluation was acceptable since the conduit was not yet in use and the UFSAR was being changed to support the installation.

This item is closed.

No violations or deviations from NRC requirements were identified in the areas reviewed.

3. Design Changes: New Emergency Diesel Generator (37700)

The inspector reviewed the progress being made on the new (sixth) emergency diesel generator (EDG). The inspector walked down the work areas with licensee personnel and independently witnessed testing in progress. The inspector reviewed quality assurance and quality control involvement for this project.



a. Cable, Raceway and Conduit Installation

The licensee had installed cables, raceways and conduit in accordance with Diablo Canyon Procedures (DCPs) 301, Revision 3, "Wire and Cable Installation," and 304, Revision 3, "Installation of Electrical Raceway and Raceway Supports." The inspector walked down the cable runs between the cable spreading room and the new EDG room and compared these installations to the DCP requirements. The inspector reviewed cable installation and certification documents.

The inspector found three locations in the cable spreading areas in the turbine building where one conduit support was used for mutually redundant Class 1E circuits. The inspector noted that the UFSAR, Section 8.3.1.4.7 stated that:

"Class 1 supports are not normally shared by mutually redundant Class 1E circuits."

The inspector discussed cable supports with the licensee. The licensee noted that most mutually redundant Class 1E circuits in the turbine building cable spreading areas had separate supports. The licensee reverified that the supports in question were seismically qualified. The licensee concluded that the UFSAR commitment was being met.

The inspector reviewed approximately 75 Class 1E conduit supports in the cable spreading areas of the turbine building found three Class 1E circuits that did not have independent supports. The inspector concluded that the installation met the UFSAR commitment.

b. New EDG Room

The inspector monitored work taking place in the new EDG room. The EDG had been leveled and installed on its foundation. Shaft alignment had been completed. The inspector reviewed the alignment data and found the data acceptable.

The licensee had removed the protective covering from the new EDG skid. The inspector noted that all mechanical openings on the diesel generator skid were covered. Some electrical equipment was open, but the room was being continuously cleaned. The inspector concluded that cleanliness controls in the new EDG room were adequate.

c. Quality Assurance Oversight of Work

The inspector reviewed the quarterly reports issued by the quality assurance organization specifically for the new EDG project. The inspector toured the construction areas with quality assurance personnel. Quality Assurance personnel had identified problems with day tank cleanliness, problems with as-built details for skid instrument tubing installed by the licensee, and problems with



electrical separation.

Based on a review of the quarterly report and discussions with quality assurance personnel the inspector concluded that the quality assurance organization was providing an effective review of ongoing and completed work for the new EDG.

d. Testing of EDG Systems

The inspector witnessed performance of part of Test Procedure TP M-44405-02E, Revision 0, "Diesel Generator 23 Control Circuitry." The inspector also reviewed additional parts of this procedure and preliminary procedures PMT 21.04, Revision 0, "Sixth Diesel 2-3 Test of Starting Air and Turbo Air System," PMT 21.06, Revision 0, "Diesel Generator (D/G) 2-3 Engine Fuel Oil System Operational Test," and PMT 21.08, Revision 0, "Diesel Generator (D/G) 2-3 Lube Oil System and Miscellaneous Equipment Operational Test."

● Craft Understanding of Procedure TP-M44405-02E:

Based on observation of the work, the inspector found that the craft personnel performing Procedure TP M-44405-02E understood the test and had all the necessary electrical drawings to verify the procedure steps.

● Procedure TP-M44405-02E Adequacy and Electrical Safety:

The inspector found that Procedure TP M-44405-02E did not specify how to make electrical CONTACT checks. The procedure directed craft personnel to verify that contacts were "Open" or "Closed," without noting whether the contacts would be energized or de-energized. Craft personnel had to review the system drawings in order to determine whether each contact was energized or de-energized. Craft personnel had to check energized contacts with a voltmeter and de-energized contacts with an ohmmeter.

The inspector considered that personnel injury or equipment damage could occur if craft personnel mistakenly tried to measure resistance with an ohmmeter across an open energized contact.

The inspector also considered that if craft personnel used a voltmeter to verify a closed contact they could mistake a de-energized open contact for an energized closed contact, since the voltmeter would indicate no voltage for both situations. The inspector concluded that lack of directions for the type of measurement required was a procedure weakness.

Procedure TP M-44405-02E, Step 9.3.3.5.a verified that relay ESR1-23 was de-energized and contacts numbered 3 and 4 were closed. The inspector reviewed Drawing SK 496276, Revision 1A,



"Schematic Diagram, 4160V Diesel Generator No. 23 and Associated Circuit Breaker." This drawing showed that a parallel closed contact existed across terminals 3 and 4 of relay ESRI-23 for the test conditions of Step 9.3.3.5.a. The inspector concluded that Step 9.3.3.5.a did not verify that contacts 3 and 4 of relay ESRI-23 were operating properly. The inspector reviewed this conclusion with the licensee. The licensee noted that contacts 3 and 4 of relay ESRI-23 were correctly verified to be open when relay ESRI-23 was energized. However, the licensee determined that Step 9.3.3.5.a did not properly verify contacts 3 and 4 were closed when the relay was de-energized. The licensee rechecked these contacts for proper operation with the relay de-energized.

The inspector concluded that TP M-44405-02E was adequate to verify proper operation of the equipment being tested based on:

- 1) Observation of personnel performing TP M-44405-02E who recognized the procedural weaknesses and by "skill of the craft" adequately assured proper operation of the equipment and assured personnel safety;
- 2) A review of associated electrical schematics; and
- 3) The licensee actions to recheck relay ESRI contact operation.

● Procedures PMT 21.08, PMT 21.06, PMT 21.04:

The inspector found the parts of these preliminary procedures reviewed to be adequate.

No violations or deviations from NRC requirements were noted in the areas inspected.

4. Walkdown of Plant Equipment

The inspector walked down the electrical equipment on the 115 foot level of the auxiliary building, including the Class 1E battery rooms, inverter/battery charger rooms and rod control motor generator set areas. Procedure NPAC C-10, Revision 10, "Housekeeping - General," defined these areas as Zone 4 housekeeping. Zone 4 included a ban on eating, drinking and smoking.

The inspector noted gum, candy wrappers, sunflower seeds and/or smoked cigarettes in 12 different locations in the auxiliary building 115' elevation electrical rooms. Most of this eating and smoking material was located on fire barriers located around vertical cable trays. The inspector also noted heavy metal wedges and a large portable electrical tool on vertical cable tray fire barriers in three locations.



The licensee removed the eating and smoking material, the electrical tool, and metal wedges from the identified areas. The licensee also discussed the requirements for maintaining proper housekeeping and material control in construction areas with plant and construction personnel.

The inspector concluded that the licensee's housekeeping control, required increased attention and that it would be reviewed in future inspections.

No violations or deviations from NRC requirements were identified in the areas reviewed.

5. Exit Meeting

The inspector conducted a telephone exit meeting on July 29, 1992, with members of the licensee staff as indicated in Section 1. During this meeting, the inspector summarized the scope of the inspection activities and reviewed the inspection findings as described in this report. The licensee acknowledged the concerns identified in the report. During this inspection, the licensee did not identify as proprietary any of the materials provided to or reviewed by the inspector.

